Invention Journal of Research Technology in Engineering & Management (IJRTEM)
ISSN: 2455-3689
www.ijrtem.com Volume 2 Issue 8 ǁ August 2018 ǁ PP 64-74

Macroeconomic stability in the DRC: highlighting the role of exchange rate and economic growth

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ABSTRACT : *This study is part of a macroeconomic approach and seeks to identify the role of the rate of economic growth and the exchange rate in controlling the macroeconomic framework. The approaches adopted in this paper are part of Keynesian thinking on macroeconomic stability using the macroeconomic stability index proposed by Burnside and Dollars (2004) and A. Amine (2005). Our results argue that economic growth is causing macroeconomic stability and that the exchange rate is negatively and significantly accounting for macroeconomic stability in the Democratic Republic of Cong***o**.

KEYWORDS: *Economic growth, error correction model, exchange rate, macroeconomic stability, macroeconomic stability index*

I. INTRODUCTION

The Democratic Republic of Congo présents a macroeconomic Framework that has been hit hard by the effets of war, political instability, and unpredictable monetary policy. The objective of this work is to detect the role of exchange rate policy (through the exchange rate) as well as the level of production on macroeconomic stability in the DRC. According to the economic literature, macroeconomic stability presupposes the reduction of the level of inflation (around 5% per year) and the elimination of its volatility (the difference between the inflation rates of two or more successive periods must be close to zero). Exchange rate policy is at the center of economic policy debates in both industrialized and developing countries. From 1973, the major industrialized countries (United States, Japan and Germany) adopted floating exchange rate regimes. In Europe, there was subsequently the establishment of monetary and exchange rate cooperation which eventually led to the adoption of the Euro. In developing countries, the evolution of exchange rate policy has been much more heterogeneous. Some countries have adopted flexible exchange rate regimes and others have chosen to fix the exchange rate of their Currency against one or more foreign currencies. Between the two extremes, a wide variety of intermediate regimes has developed and many countries have also changed exchange rate regimes several times in Latin America, Africa or Asia.

In addition, it is recognized that the exchange rate system has effects on macroeconomic volatility. Indeed, the exchange rate policy can influence this relationship by modifying the direct impact of volatility on growth. For example, foreign exchange policy can alter the impact volatility has on growth by affecting the economy's ability to adjust to volatility. Thus, for the same level of volatility, the cost of growth induced by volatility will differ according to the exchange rate system in force. Similarly, the impact of the exchange rate regime on volatility may depend on country characteristics such as the level of financial or economic development (Rogoff et al, 2004) [1].

During the 1990s, which was marked by socio-political instability brought about by the process of democratization, the Congolese Economy experienced a multi-faceted crisis characterized notably by the degradation of basic infrastructure and the looting of the production Tool, the breakdown of structural cooperation with the international community resulting in the drying up of external aid and foreign investment, the expansion of chronic deficits in state operations and their financing by printing money, leading to hyperinflation and sharp depreciation of the national currency and the multiplicity of exchange rates (Central Bank of Congo, 2012) [2]. Indeed, throughout the 1990s and early 2000s, the Congolese Economy accumulated several macroeconomic imbalances. The Congo's external accounts thus recorded serious deficits in the current account, with close to 12% of GDP. They were covered by an accumulation of arrears of external debt payments. In parallel with these external deficits, the State has steadily accumulated fiscal deficits (7% of GDP on average until 1998), financed exclusively by advances from the Central Bank. The national currency has not withstood

the damage caused by strong and variable inflation. It was quickly abandoned by economic agents in favor of stable foreign currencies and more particularly for the benefit of the US dollar. In addition, it should be noted that since 2001, the Central Bank of Congo conducts its exchange rate policy as part of a floating exchange rate regime. Taking into account, on the one hand, the significant impact of exchange rate fluctuations on the behavior of domestic prices and, on the other hand, the need to protect the economy against negative balance of payments shocks, the Central Bank of Congo has set itself two objectives in terms of exchange rate policy, namely: smooth exchange rate fluctuations in order to preserve the stability of the external value of the national currency and increase the level of foreign exchange reserves (Central Bank of Congo, 2013) [3].

In the light of the foregoing, we will try throughout this essay to answer the Following question : What is the role of the exchange rate and the level of production on macroeconomic stability in the Democratic Republic of Congo ?

Theoretical Overview : The link between macroeconomic stability, economic growth and the exchange rate suffers from sufficient and relevant literature. Nevertheless, some research has focused on the influence that macroeconomic stability has on the link between FDI (Foreign Direct Investment) and growth. On this question, the most notable contribution is that of Bleaney (1996) [4]. From a sample of developing countries, the author shows that over the 1980-1990 period, macroeconomic stability is associated with stronger growth for a given rate of investment (domestic and foreign).

The interpretation of this finding is that Sound macroeconomic management (with, for example, a low inflation rate) creates a more secure overall environment for investors, thereby promoting growth. At the same time, macroeconomic stability, like political stability, is one of the major determinants of the attractiveness of the country for foreign investors. In another work (Gbakou, Sadni Jallab and Sandretto, 2008) [5] have attempted to evaluate the influence that macroeconomic stability could have on the impact of FDI in North African and Middle East countries. The authors were able to highlight the fact that FDI promotes growth provided that the inflation rate is kept at a sufficiently low level, with a threshold effect that they have attempted to quantify.

Contrary to this research, ours attempts to evaluate the cause-and-effect relationship between macroeconomic stability, economic growth and the exchange rate in the Democratic Republic of Congo. We will therefore seek to see simultaneously the cause of economic growth, macroeconomic stability and the exchange rate.

Stability, Currency and Welf are : The question of welfare is not separable from the way of looking at time. In a static or pseudo static perspective, welfare is the characteristic of an equilibrium and will be determined by the influence of this or that particular variable on this equilibrium. Thus, the holding of idle cash balances associated with a positive nominal interest rate reduces the welfare of consumers. Their elimination and the increase in the level of welfare require a zero nominal interest rate, ie a negative inflation rate when the natural real interest rate is positive. Similarly, price rigidities, in the face of positive technological shocks, not only keep the product below its natural level, but are also an obstacle to the necessary restructuring and hence cause the decline in productivity gains (and competitiveness in an open economy). They reduce welfare. Their elimination calls for structural reforms in the direction of greater flexibility in product and labor markets (Lucas, 2001) [6].

The underlying theory of welfare is, however, questionable. It ignore the temporal articulation of imbalances and their effect in terms of wealth creation and the use of resources. In fact, it ignores the question of stability. From an evolutionary perspective, it is difficult to arrive at a quantifiable conclusion about overall welfare. Current imbalances are undoubtedly a source of a loss of welfare, but only in the light of a situation of inter-temporal equilibrium. What really counts is the sequence of imbalances over time, which by definition escapes the dynamic general equilibrium models. Thus, that inflation constitutes a harmful tax in an equilibrium environment is trivial. On the other hand, the cost of a monetary regime under the random walk is much less so (Leijonhufvud 1984/2000) [7] [8]. The uncertainty and volatility of the expectations that this regime contributes to make persistent, if not increasing inflation, fuel a decline in investment incentives and a real loss of welfare. In addition, a monetary regime that guarantees a Near equilibrium investment with transient inflationary pressures is fueling growth and hence welfare gains. Current imbalances in the form of excess demand are unavoidable if we want to have future production capacity that will extinguish inflationary pressures. That the public deficit is harmful in an equilibrium environment is just as trivial. The risk of instability is much less. The public deficit is an imbalance that responds to imbalances that preceded it and generates future imbalances. Thus, deficits, far from being the result of bad government behavior, may simply be the means to respond to inappropriate

Behavior of financial actors, to avoid the bankruptcy of these actors and to prevent an economic depression. This is what recent experience in most countries of the world teaches, as was the experience of the Latin American countries (Leijonhufvud 2009) [9]. So, of course, these deficits are likely to lead to new taxes or a tax in the form of inflation. But, on the one hand, these deficits were both necessary and unavoidable, on the other hand, what will happen to the solvency of governments will depend on what will happen to the growth that depends in part on the deficits in question. That's why the question is not trivial. That's why the enactment of a rule against budget deficits to protect against future inflation is absurd. It is a question of compensating the deficits of the day by the surpluses of tomorrow and not of ab initio abolishing the deficits.

Both monetary policy and fiscal policy are there to contain instability that is inherent in a market economy subject to structural change. They are there to smooth the imbalances, to allow that they compensate the selves in time, not to claim to eliminate them. They alone are not enough for this task.

Macroeconomic Framework of the DRC ;The DRC recorded strong macroeconomic results during the five-year period 2010-2015. Gross domestic product (GDP) growth estimates for this period stand at 7.58% in real terms compared with 3.30% a decade earlier (Table 1). Taking advantage of a favorable global environment, the country continues to benefit from significant financial and trade flows related to trade with non-European countries. Growth continues to be driven by the mining sector and, in particular, copper production which has increased by 52% in volume. The trade and building sectors are also performing well according to the IMF report (IMF, 2014) [10].

Regarding the inflation rate and the exchange rate, it should be noted that inflation has decreased significantly with time. Indeed, the average inflation rate stood at 6.17% during the 2010-2015 five-year period, when it stood at 99.37% a decade earlier. According to the IMF, this decline could be explained by a restrictive fiscal policy, the control of monetary aggregates and the absence of major shocks on import prices. On the exchange rate side, there is a significant increase during the period 2000-2015; Nevertheless, it must be noted that the exchange rate remained remarkably stable during the five-year period 2010-2015. According to the IMF, this situation could be explained by the accumulated international reserves ($50 million in 2013) which have only made it possible to maintain the level of import coverage at 7.7 weeks of imports of goods and services (IMF, 2014). From the above, we conclude that the Congolese economy has returned to a state of stability much more interesting than in previous years as shown by the indicator of economic growth rate and inflation (Table 1). This situation was also supported by Ngonga Zinga (2003) [11] who showed how the DRC regained relative stability following the implementation of economic programs. Indeed, the author showed in his research that the inflation rate measured by the general index of consumer prices on the Kinshasa markets and calculated by the Central Bank of Congo was reduced from 511% in 2000 to 9.8% in 2004 while in 2002 the growth rate returned to the positive zone, for the first time in 20 years.

Starting from this situation, we will examine the source of the macroeconomic stability that can have a monetary origin (materialized by the exchange rate in the present work) or a real origin (materialized by the national production).

Table 1

Analysis of indicators of macroeconomic stability

Period	**1980-1989**			**1990-1999**			**2000-2009**			**2010-2015**		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**
GDP Growth rate (in %)	1.81	-1.27	5.54	-5.47	-13.47	0.70	3.30	-6.91	6.74	7.58	6.86	8.97
Inflation (en %)	56.95	23.82	104.07	3367.18	29.15	23773	99.37	2.8	513.91	6.17	1.63	15.32
Exchange rate (FC/USD)	3.31	1.2	9.33	1.98	1	5.19	414	21.82	809.79	919.36	905.91	925.98

Source: Our production using data from the World Bank and the BCC.

II. METHODOLOGICAL APPROACH

Many studies have relied on inflation to measure macroeconomic stability in both developed and underdeveloped countries. It is therefore the neoclassical monetarist approach that tends to consider macroeconomic stability as primarily a question of price stability in the medium and long term. Unlike monetarists, Keynesians believe rather that macroeconomic stability is assured when there are no significant imbalances in underemployment. As part of our research, we will not use the monetarist approach but we will adopt the approach chosen by Burnside and Dollars (2004) [12] as well as A. Amine (2005) [13], which takes into account three indicators to calculate the macroeconomic stability index. Indeed, to measure macroeconomic stability, Burnside and Dollar (2004) consider that the calculation of the macroeconomic stability index should be done. According to them, this index brings together three elements that are necessary and occupy a key place in the measurement of macroeconomic stability. These indicators identified by these two authors are : the budget surplus, the inflation rate and the opening rate in the same "Policy" variable. These are the indicators used to explain macroeconomic stability in 56 underdeveloped countries.

The model proposed by Burnside and Dollar (2004) is given by the following relation:

Policy = 1.28 + 6.85 Budget surplus – 1.4 Inflation + 2.16 Openness (1)

- Study variables

The Macroeconomic Stability Index (ISM): We used the Macroeconomic Stability Index to measure macroeconomic stability in the DRC. For the chosen period, we will have to calculate the macroeconomic stability indices with a view to relating them to the exchange rate and other explanatory variables. This indicator will be calculated using the model proposed by Burnside and Dollar (2004) above. The calculation of this index is made possible by the knowledge of the weighted inflation rate, openness rate and budget deficit of their respective coefficients as calculated by Burnside and Dollar. Parallel exchange rate (TCP): This indicator refers to the value of a national currency relative to another foreign currency (the dollar in this case). The exchange rate index is an indicator by which external shocks affect the level of inflation. An increase in this rate implies a nominal appreciation of national currency. In addition, the exchange rate policy can have effects on inflation, through the trade balance. Indeed, by playing on the value of the national currency, the State can favor the export (by depreciating its currency) or make the import less expensive (by appreciating its currency). This last solution can be useful to reduce inflation, especially when it comes to imported inflation. Appreciating money can also, theoretically, act on demand by slowing it down, which can lead to lower prices (and hence lower inflation) if inflation is caused by too much demand. The growth rate of GDP (CROIS): Economic growth is considered one of the most exciting phenomena in macroeconomics because all countries aspire to well-being and the latter is not possible without growth. It is measured by the rate of increase in GDP. In this research we will take into account real GDP.

From the above, our specified model is formalized as follows:

$$D(ISM_t) = \beta_0 + \beta_1 D(TCP_t) + \beta_2 D(CROIS_t) + \beta_3 ISM_{t-1} + \beta_4 TCP_{t-1} + \beta_5 CROIS_{t-1} \quad \textbf{(2)}$$

Data source : The database we use in this study is compiled from the World Bank's "World Development Indicators" (WDI) 2015 CD-ROM and supplemented by data from the Central Bank of Congo. The period considered is between 1980-2015. The choice of the World Bank's database as the source of our data was motivated by our desire to have reliable data with the understanding that the World Bank site is the most reliable source of data for R & D. Congo. This choice would prevent us from having in our possession masked data that does not reflect reality.

Estimation technique: To estimate our model, we will first report the stationarity of the variables to be used as well as their cointegrations. This is necessary because the economic and financial variables are rarely realizations of stationary processes on the one hand, and on the other hand to analyze the long-term relationships between the variables under study.

The non-stationarity of the variables is a very recurrent characteristic. It can give rise to fallacious regressions. In this case, only one solution is possible: a cointegration relation when the linear combination of several non-stationary variables in the same degree is stationary.

In practice the unit root tests are based on the modeling of a series by an autoregressive process AR (p):

$$X_t = \sum_{i=1}^{p} \rho^i Y_{t-i} + \varepsilon_t$$

The simplest case is that of a random walk:

$$Y_t = \rho Y_{t-1} + \varepsilon_t \qquad (3)$$

The general idea of the Dickey Fuller test is to determine whether the series has a unit root. To do this, various tests exist: the simplest is the Dickey-Fuller test which assumes:

H0: ρ = 1, H1: ρ <1

From the model (3) we subtract both sides by Yt-1 we will have:

$$Y_t - Y_{t-1} = \rho Y_{t-1} - Y_{t-1} + \varepsilon_t \Rightarrow \Delta Y_t = (\rho - 1) Y_{t-1} + \varepsilon_t$$

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \qquad (4)$$

Where δ = (ρ-1) and Δ = the first difference of Yt

In practice instead of estimating the model (3) we estimate the model (4) and we test the null hypothesis that δ = 0 or ρ = 1 (the series is nonstationary) against the alternative hypothesis δ 0 or ρ <1 (the series is stationary).

If we test the stationarity of a series, in which we include its tendency and its constant, by the test of Dickey Fuller (DF) starting from the model (4) we will have:

$$\Delta Y_t = \varphi_0 + \varphi_{1t} + \delta Y_{t-1} + \varepsilon_t \qquad (5)$$

With regard to stationarity, it should be noted that two non-stationary series (Yt ~> I (1) and Xt ~> I (1)) are said to be cointegrated if we have:

$$Y_t - aX_t - b = \varepsilon_t \sim> \mathrm{I}(0) \qquad (6)$$

The series and Xt are then noted:

Xt, Yt ~> CI (1,1) (7)

In general, if Xt and Yt are two series I(d) then it is possible that the linear combination εt = Yt - aXt - b is not I(d) but I (d-b) where b is a positive integer (with 0< b ≤ d). The vector (1-a-b) is called "cointegrating vector". The series are then cointegrated (Xt, Yt ~> CI (d, b)).
Finally, the Error Correction Model (ECM), which reconciles the non-stationarity of variables and cointegration, will be estimated in order to give us information on the short-term behavior of our series as well as the dynamics of long term. Indeed, if we have two cointegrated series ($Y_t - \hat{a}X_t - \hat{b}$ ~> I(0)), we can estimate the following error correction model (ECM):

$$\Delta Y_t = \gamma \Delta X_t + \delta(Y_{t-1} - aX_{t-1} - b) + \nu_t \text{ with } \delta \prec 0 \qquad (8)$$

We can notice that the parameter δ must be negative so that there is a return of Yt to its long-term equilibrium value which is (aXt-1 + b). Indeed, when Yt-1 is greater than (aXt-1 + b), there is a restoring force towards the long-term equilibrium only if δ<0. The ECM can be used to jointly model the short-term (represented by the first difference variables) and the long-term (represented by the level variables) dynamics. The short-term dynamics is written:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 X_t + \alpha_3 X_{t-1} + \nu_t \qquad (9)$$

The long-term dynamic is expressed as follows:

$$Y_t = aX_t + b + \varepsilon_t \qquad (10)$$

because in the long run, we have Yt-1 = Yt and Xt-1 = Xt.

III. RESULTS

The data used in this research covers the period from 1980 to 2015 in order to get an idea of the trend evolution of the macroeconomic quantities under analysis.

Table 1

Stationarity test result

Variables	***A Level***				***First difference***			
	ADF	***Seuil***	***t-stat***	***Prob***	***ADF***	***Seuil***	***t-stat***	***Prob***
ISM	***-5.269715***	***1%***	***-4.243644***	***0.0007****	***Stationary at the level***			
		5%	-3.544284					
		10%	-3.204699					
CROIS	***-0.442248***	***1%***	***-4.252879***	***0.9816***	***-4.457353***	***1%***	***-4.252879***	***0.0060****
		5%	-3.548490			5%	-3.548490	
		10%	-3.207094			10%	-3.207094	
TCP	***-1.842232***	***1%***	***-4.252879***	***0.6618***	***-3.547397***	***1%***	***-4.252879***	***0.0501******
		5%	-3.548490			5%	-3.548490	
		10%	-3.207094			10%	-3.207094	

Source : Our confection with Eviews 7
*; **; *** indicates the significance at the respective thresholds (Seuil) of 1%; 5% and 10%

The null hypothesis of non-stationarity of the variable under study will be rejected in case the Student's statistic is lower than the Augmented Dickey Fuller (ADF) test value. We can also rely on the critical probability by rejecting the null hypothesis when this probability is below the significance level (1%, 5% or 10%). As a result, we find that the macroeconomic stability index variable is stationary at the 1% level. This variable shows macroeconomic instability during the period under study (-1272.74 on average) with high volatility.

It is clear that the GDP/capita (Gross Domestic Product per capita) variable is not stationary at all thresholds but becomes stationary in first difference at the 1% threshold. This variable indicates a low level of production in the DRC since during the period under study, it is 356.32 USD per capita and per year with high volatilities locating its standard deviation at 163.7 USD. Finally, the exchange rate indicator responds to a first difference stationarity at the 10% threshold. This variable has an average value of 269.74 FC/USD with high volatilities, setting its standard deviation at 360.97 FC/USD. This can be read directly by looking at the maximum value which is at 925 FC/USD whereas at a certain period the Zaire/USD exchange rate was 1.00. Zaire is the old name of the Congolese franc.

Table 2

Result of the cointegration test

Sample (adjusted): 1980 2015

Included observations: 30 after adjustments
Trend assumption: Linear deterministic trend (restricted)
*Series: **ISM CROIS TCP***
Lags interval (in first differences): 1 to 2
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.576053	49.58947	42.91525	0.0094
At most 1	0.349722	21.27061	25.87211	0.1683
At most 2	0.192820	7.068869	12.51798	0.3374

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Source: Our confection with Eviews 7

As a reminder, the cointegration test (Johansen's approach, 1998) [14] proposes maximum likelihood estimators to test the cointegration of series by performing a cointegration rank test. It is therefore necessary to identify the long-term equilibrium relationship between two or more variables by searching for the existence of a cointegration vector. As a result, the test indicates the presence of a single long-term relationship as indicated by the maximum likelihood test. This allows us to retain the error-correcting model that gives both the long and short-term trend (see equation (2)).

Table 3

Causality test: Granger approach

Pairwise Granger Causality Tests
Sample: 1980 2015
Lags: 2

Null Hypothesis:	***Obs***	***F-Statistic***	***Prob.***
CROIS (GDP/Cap) does not Granger Cause ISM	34	2.86221	0.0734
ISM does not Granger Cause CROIS (GDP/Cap)		0.02445	0.9759
TCP (XRate) does not Granger Cause ISM	34	0.41264	0.6657
ISM does not Granger Cause TCP (XRate)		0.09849	0.9065
TCP does not Granger Cause CROIS	34	0.60248	0.5542
CROIS does not Granger Cause TCP		1.58453	0.2223

Source: Estimate made using Eviews 7

This analysis will allow us to get an idea of the causality between macroeconomic stability, the economic growth rate and the exchange rate in the DRC. The causality assumption will be validated when the probability associated with the confidence level is less than 10%. Thus, we find that the growth rate of the economy is the only magnitude that causes macroeconomic stability in the DRC and this unequivocal relationship starts from economic growth towards macroeconomic stability. That said, improving the level of production in the DRC would improve the macroeconomic framework.

Table 4

Result of the estimation of the model with error correction

Dependent Variable: D(ISM)[1]				
Method: Least Squares				
Sample (adjusted): 1980 2015				
Included observations: 36 after adjustments				
Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
C	158.0690	13140.05	0.012030	0.9905
DLOG(GDP/Cap)	5407.488	6950.542	0.777995	0.4431
DLOG(XRate)	-4103.716	614.1272	6.682193	0.0000
D(ISM(-1))	***-0.522663***	***0.093644***	***-5.581368***	***0.0000***
LOG(GDP/Cap(-1))	-22.70670	2177.916	-0.010426	0.9918
LOG(XRate(-1))	-211.1150	292.8505	-0.720897	0.4769
R-squared	0.755270	Mean dependent var		3.400019
Adjusted R-squared	0.711568	S.D. dependent var		7802.208
S.E. of regression	4190.246	Akaike info criterion		19.67769
Sum squared resid	4.92E+08	Schwarz criterion		19.94705
Log likelihood	-328.5208	Hannan-Quinn criter.		19.76955
F-statistic	17.28232	Durbin-Watson stat		1.796536
Prob(F-statistic)	0.000000			

Source : Estimate made using Eviews 7
JB=0,60 (Prob : 0.7415) ; LM stat=2,26 (Prob : 0,4445) ; White test (chi-sq)=97,6 (Prob : 0,0000)

The estimated error correction model is globally significant with respect to the F-stat value (with a probability of 0.0000), which leads us to validate the relevance of our model. In addition, the error correction model is suitable for our study given the significance, attached to a negative value, of the restoring force coefficient. There is therefore an error-correcting mechanism: in the long term, the imbalances between macroeconomic stability, economic growth and the exchange rate are offset so that the two series have similar evolutions. Indeed, the error correction coefficient represents the speed at which any imbalance between the desired and actual levels of macroeconomic stability is absorbed in the year following any shock. This means that we are able to adjust 71.16% of the imbalance between the desired and actual level of macroeconomic stability in the DRC. Thus, shocks on macroeconomic stability are corrected to 71.16% by the effect of "feedback"; in other words, a shock in one year is fully absorbed after one year, ten months and 28 days.The value of the Breush-Godfrey test indicates that the errors are independent at the 5% threshold. In addition, the hypothesis of absence of heteroskedasticity is rejected with respect to the statistical value of the test of White while the hypothesis of normality of the residues is accepted at the 5% threshold with respect to the probability associated with the statistic of Jarque-Bera. Before proceeding to the analysis of the variance that will allow us to see the degree of explanation of the exogenous variables selected for the forecast error of the macroeconomic stability, we say that the macroeconomic stability is explained and that on the statistical level by the exchange rate in a short-term dynamic.

[1] La variable « indice de stabilité macroéconomique n'a pas été transformée en logarithme étant donné qu'elle renferme certaines variables négatives.

Table 5

Outcome of the analysis of variance decomposition: Macroeconomic Stability Indicator

Variance Decomposition of ISM:

Period	*S.E.*	*GDP/Cap*	*XRate*	*ISM*
1	5687.785	0.532741	0.406343	99.06092
2	6158.102	15.01233	0.417697	84.56997
3	6238.421	15.32215	1.520550	83.15730
4	6265.189	15.54737	1.993686	82.45895
5	6277.662	15.51013	2.273333	82.21654

Cholesky Ordering: PIBHAB TXCHANGE ISM

Source: Authors' Analysis Using Eviews 7

The results of the variance decomposition indicate that the variance of the forecast error of macroeconomic stability is for 82.2% due to its own innovations (budget balance, Inflation and trade opening rate), for 15.5 % to economic growth and only for 2.3% to the exchange rate.

IV. ECONOMIC LOOK AT THE RESULTS

We have selected two sets of indicators to explain macroeconomic stability in the Democratic Republic of Congo: one is monetary and the other is from the real sector.

Real Sector Indicator: Gross Domestic Product: Economic growth is not statistically significant in the DRC, that is, macroeconomic stability is not explained by economic growth in the DRC in a long-term and short-term dynamics. On the other hand, the causality test indicates that economic growth causes macroeconomic stability in the DRC at the 10% threshold. This result leads us to say that achieving a certain level of stability in the DRC implies a considerable improvement in economic growth. This situation can also be explained by an actual production below the potential of the economy as underlined by a BCEAO research (BCEAO, 2012). This result is similar to that found by K. Leo Spencer and O. Mahamat (2014) who found a lack of correlation between economic growth and inflation in the Central African Monetary Union. The authors suggest that this situation could be explained by the low banking rates in the Union countries and by the weakness of the business climate which limits the ability of banks to distribute credit from the savings collected. This situation significantly alleviates the demand pressures that may arise from revenues from the exploitation of mineral resources and commodities in the Union. Indeed, the rate of banking that is represented in the database of the World Bank (Word Development Indicator) by automated teller machines (per 100,000 adults) was 1.14% in 2014 while the depth of the financial system calculated as the ratio of credit to the private sector and GDP was 6.76% in 2015. The shallow depth of the financial system in a context of bank over-liquidity could be associated with the weakness of the business climate, notably the lack of quality financial information that may justify the reluctance of banks to distribute bank credit to small and medium-sized enterprises. Contrary to the results of our analyzes, the results found by N. Muganza (2015) [15] confirm a long-term negative relationship between economic growth and the inflation rate in the DRC at the 5% level. Indeed, according to the author's results, it can be observed that inflation negatively affects economic growth in the DRC by a phenomenon of stagflation ie the coexistence of persistent inflation and the decline in the level of production. As a result, the cost of inflation (growth loss induced by high inflation) is extremely high. These results are similar to those found by Ndiaye and MA Konte (2012) who argue that, in the DRC, recurring fluctuations in inflation have generated a very high average inflation rate, to the detriment of the economy by not favoring the economy investment and savings.

Monetary Sector Indicator : Our analyzes show that in the short term the exchange rate is statistically significant and negatively affects macroeconomic stability in the DRC at the 1% level. The same result shows us that there is no causal relationship between the exchange rate and macroeconomic stability. Thus, in the short term, when the exchange rate increases by 1%, macroeconomic stability is expected to decline by 4103.72. This result provides ample evidence that macroeconomic stability depends to a large extent on exchange rate control and also points to a persistent depreciation of the national currency of DRC against the dollar. Indeed, the rapidity of the response of macroeconomic stability in the DRC to exchange rate fluctuations can be explained

either by price flexibility, especially imported end products, or by an accommodating and unreliable monetary policy. Devereux (2001) [16] has found that in some (mostly underdeveloped) countries, importers immediately adjust their prices in proportion to their rising costs as a result of the depreciation of the exchange rate. Taylor (2000) [17] suggests that if firms lack confidence in monetary policy, then they do not delay in passing on their price increases to prices, as they do not see that this exchange rate depreciation could be transitory. These results are consistent with those found by N. Muganza (2015) who shows that in the DRC, any depreciation of 1% of the national currency leads to a price increase of 1.8% in the short term and 0.26% in the long term. According to the author, this situation is explained by a strong dollarization of the Congolese economy that pushes economic agents to divest themselves of the national currency in favor of the foreign currency (the US dollar).

In addition, our analyzes show that the exchange rate is not acting on the economic growth of the DRC in a long-term dynamic. This situation is explained, and according to economic theory, by the fact that for some time the DRC's monetary policy has focused on the control of inflation. In such a situation, changes in the exchange rate do not affect the trend inflation rate.

V. CONCLUSION

The objective of this article focused on the macroeconomic stability of the DRC was to show the role of the rate of economic growth and the exchange rate in the mastery of the macroeconomic framework. The analysis of macroeconomic stability is based on two approaches: one termed neoclassical monetarist and which assumes that macroeconomic stability is based on price stability in the medium and long term. This approach has been the subject of much research in both industrialized and underdeveloped countries. The second approach is that of Keynesians and considers that macroeconomic stability is based on the absence of significant underemployment imbalances. Our approaches have been aligned in this second approach using the Macroeconomic Stability Index developed by Burnside and Dollars (2004) and A. Amine (2005). The data used in this study come from the World Bank database (WDI) and are complementarily supplemented by data from the Central Bank of Congo for the period 1980-2015. The stationarity test applied in this study shows that only macroeconomic stability is stationary at the level when the economic growth rate and the exchange rate are stationary in first difference. The cointegration test demonstrates the presence of a long-term relationship, which has led us to retain error correction modeling in order to have the long-term and short-term trend. Our results show that economic growth is the only size that causes macroeconomic stability, which means that the attainment of a desired level of macroeconomic stability is caused by the real sector. Nevertheless, this indicator proved statistically insignificant to explain the macroeconomic stability of the DRC. This situation is explained by the low production of the DRC which seems to be below the potential of its economy, low rates of banking in the DRC as well as the inadequacy of the business climate limiting the ability of banks to distribute credit from the savings collected. Regarding the exchange rate, our results reject the hypothesis of causality between the exchange rate and macroeconomic stability in the DRC, while arguing that the increase in the exchange rate is detrimental to macroeconomic stability in a short-term dynamic term. Nevertheless, the exchange rate does not explain macroeconomic stability in the long term. These results thus reveal that the DRC can escape the negative effects of exchange rate volatility by adopting a monetary policy focused on the control of inflation. In addition, the results of the variance decomposition indicate that the mastery of macroeconomic stability largely depends on the control of the budget balance, inflation and the market opening rate at 82.2%. Finally, we do not claim to have all analyzed in this article, and we encourage further research on this topic of macroeconomic stability in the DRC or other developing countries.

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Nyamugira Biringanine Alex , Macroeconomic stability in the DRC: Highlighting the role of exchange rate and economic growth. Invention Journal of Research Technology in Engineering & Management (IJRTEM), 2(8), 64-74. Retrieved from www.ijrtem.com.